

In Europe, the current ADI has been set at 0.3 mg per kg of bodyweight per day (written as 0.3 mg/kg bw/d),<sup>82</sup> while in the United States glyphosate's allowable daily intake is nearly 6 times higher at 1.75mg/kg bw/d.

These wide differences in allowable daily residue exposure mean that U.S. citizens are legally exposed to nearly 6 times the amount of glyphosate on a daily basis than individuals in Europe.

## Changes in Daily Exposure Based on Industry Science, at Monsanto's Request and a History of Scientific Fraud

In the case of glyphosate, this Acceptable Daily Intake level has been based on limited scientific studies presented to the EPA by glyphosate's original applicant for approval, Monsanto. As in Europe, the U.S. EPA has historically made these decisions based on corporate in-house scientific studies that have never gone through the peer review process, nor has any of the original data from these studies reported to regulatory agencies ever been made public.

More importantly, the differences in current Acceptable Daily Intake levels between the European Union and the U.S. are significant, do not represent the best or most current scientific data and are shrouded in controversy. This is not to say that this report endorses the European Union standard, which recent scientific evidence suggests establishes a tolerance too high to be guaranteed to safeguard human health.

## U.S. Acceptable Daily Intake for Glyphosate (ADI) Originally Set by EPA at 0.1 ppm

According to internal EPA documents, **the original ADI set by the EPA toxicology division was 0.1 mg/kg/day in the early 1980s.**<sup>83</sup> During this same period under the Reagan Administration, in 1985, the EPA classified glyphosate as a possible carcinogen, **Class C**, based on a long-term feeding study in which male mice fed glyphosate developed kidney tumors.<sup>84</sup>

The EPA initially defended this position, but Monsanto successfully submitted "historical control data" from multiple other unpublished studies and in a June 26, 1991 memo, the EPA reclassified glyphosate as **Class E** or "non-carcinogenic for humans" after much back-and-forth for several years with Monsanto scientists and lobbyists "based upon lack of convincing carcinogenicity evidence in adequate studies in two animal species."<sup>85</sup>

While Monsanto and other chemical manufacturers in the United States defend the low toxicity of Roundup and other glyphosate-based herbicides,

regulators in Europe took a more cautious scientific approach in setting the Acceptable Daily Intake limits for their citizens.

Rather than take Monsanto's approach on allowable levels, in its 1998 evaluation of glyphosate, Germany's Federal Office of Consumer Protection and Food Safety (BVL) determined that the allowable residue level should be set at 0.3 mg per kilogram of body weight, versus the high level of 1.75 ppm set by the EPA, or nearly 6 times higher than acceptable levels allowed in Europe based on industry feeding trials that they believed to be the most sensitive to the effects of the chemical.<sup>86</sup>

The decision-making process of the German government's Consumer Protection and Food Safety agency was spelled out in a public document that stated obvious concern over the high ADI chosen by their U.S. counterparts at the EPA. According to the BVL glyphosate review:

***"A very high ADI of 1.75 mg/kg bw was proposed in the joint dossier of Monsanto and Cheminova and is based on the NOEL for maternal toxicity in a teratogenicity study in rabbits (Tasker, 1980). It is discussed here since it is far outside the range of all the other suggested values."***<sup>87</sup>

The German review document details the then-current ADI level requests by various chemical manufacturers based on industry-approved studies made available to respective food safety agencies around the world in the 1990s. These original Acceptable Daily Intake levels range from 0.05 to 0.1 mg/kg bw/day, 0.15 mg/kg bw/day and 0.3 mg/kg bw/day and the requested U.S. level of 1.75 mg/kg bw/day submitted by Monsanto and Danish pesticide maker Cheminova. (See original chart on page 16)

It's interesting to note that the U.S. ADI level of 1.75 mg/kg bw/day is 17.5 times the original ADI set by the EPA in the 1980s<sup>88</sup> and was obviously raised in anticipation of the approval of future GMO crops. Monsanto had already begun advance work on engineering genetically modified crops that were design to survive being sprayed with their proprietary flagship herbicide Roundup.

In their 1998 review of glyphosate, German regulators stated their objections to the EPA and Monsanto's ADI request in clear scientific terms:

***"The acceptable daily intake should be based on the highest dose at which no adverse effect is observed in the most appropriate study in the most sensitive species. In the case of glyphosate, the different notifiers have proposed ADI values which cover a wide range between 0.05 and 1.75 mg/ kg bw (see table B.5.10.2-1). This variance is due to the different studies used as***

the respective basis for ADI calculation but may also result from a controversial evaluation of controversial studies.

A very high ADI of 1.75 mg/kg bw was proposed in the joint dossier of Monsanto and Cheminova and is based on the NOEL for maternal toxicity in a teratogenicity study in rabbits (Tasker, 1980). It is discussed here since it is far outside the range of all the other suggested values. This proposal was not accepted by the Rapporteur for the following reasons:

1. The NOEL for maternal toxicity in the respective study was established by the Rapporteur at 75 mg/kg bw/day instead of 175 mg/kg bw/day (see section B.5.6.2.2.2).
2. If a NOEL of 175 mg/kg /bw/day for the above mentioned rabbit study would have been accepted, one could identify some valid studies revealing adverse effects at lower doses. In a recent long-term study in rats (Suresh, 1996), effects occurred in female animals at a dietary dose level of 1000 ppm (ca 60/mg/bg bw/day). **The NOELs [No Observed Effect Level] and LOELs [Lowest Observed Effect Level] established in a further chronic rat study (Atkinson et al., 1993) and in two other rabbit teratogenicity studies (Suresh, 1993; Brooker et al., 1991) were well below 175 mg/kg bw/day.**

Usually, a chronic rat study is considered most appropriate to derive the ADI. Since the rat proved the most sensitive species upon long-term exposure, it is suggested to establish the ADI for glyphosate on the basis of the chronic toxicity data obtained in rats.<sup>89</sup>

### Current Scientific Research Calls for Much Lower Allowable Glyphosate Residues for Human Food Products

This spring, as regulators in the European Union attempted to re-register glyphosate for another 15 years, new independent scientific evidence was brought forward that called into question even the EUs more cautious 0.3 mg/kg bw/day allowable glyphosate residue level.

In the past 10 years alone, real scientific concern over the chemical's safety has only increased due to the widespread explosion in the use of Roundup and glyphosate-based herbicides in conjunction with industrial agriculture and further pressures on farmers to adopt GMO agriculture linked to herbicide tolerant traits.

In a study titled "*Transcriptome profile analysis reflects rat liver and kidney damage following chronic ultra-low dose Roundup exposure*," a team of international scientists performed a



transcriptome (gene expression) analysis of the liver and kidneys from rats fed an extremely low dose of Roundup. This resulted in a daily intake of glyphosate of only 4 nanograms per kilogram of bodyweight per day, which is 75,000 times below the EU acceptable daily intake (ADI equivalent) and 475,000 times below the US chronic reference dose (ADI equivalent). In other words, **a dose of Roundup that was far below what is permitted by regulators and believed to be safe to consume on a daily basis over the long term was found to damage the liver and kidneys of rats.** These results were statistically significant.<sup>90</sup>

While transcriptome analysis is highly predictive of disease status or organs, it cannot predict the corresponding disease states with absolute certainty, as not all changes in gene function result in changes in levels of the genes' protein products and metabolites. Such definitive proof has to be provided by additional molecular profiling analysis, namely proteomics (protein profile) and metabolomics (small molecule metabolite profile). The proteomics and metabolomics analyses give a direct measure of the organ's composition, so they are able to provide a direct indicator of the health or disease status of the organ in question.

**The authors concluded that long-term exposure to Roundup “at an ultra-low, environmental dose can result in liver and kidney damage with potential significant health implications for animal and human populations.”**

—MESNAGE ET AL, 2015

A separate study looked at the evidence for teratogenic effects (birth defects) in the industry studies submitted to regulators to gain market authorization for glyphosate. The authors reviewed

the German government’s original 1998 scientific analysis of allegedly safe daily glyphosate exposure levels and found that the government regulators had “introduced significant bias” into their review by intentionally excluding toxicity studies in rabbits that found harmful effects of glyphosate at much lower levels than their analysis admitted.<sup>91 92</sup>

Simply by reviewing the same studies that the German government regulators did in 1998, the authors calculated that the EU acceptable daily intake level of glyphosate was currently 3 times higher than it should be if all the industry studies had been rigorously evaluated.

By including in their analysis two independent peer-reviewed studies that had been completed since the EU set the acceptable daily intake for glyphosate residue in 2002, **the authors concluded that current ADI should be dramatically reduced to 0.025 mg/kg bodyweight per day or “12 times lower than the ADI proposed by the German regulators, which is currently in force in the EU and used as a basis for the maximum residue limit for food and feed.”**

### Multi-Generational Rat Studies on Glyphosate with Recommended ADI Levels

Table B.5.10.2-1: Summary of ADI values proposed by the different notifiers and by the Rapporteur

Notifier	ADI (mg/kg bw)	Toxicological data on which this ADI proposal is based	Remarks of the Rapporteur
Monsanto/ Cheminova	1.75	Teratogenicity study in rabbits, NOEL: 175 mg/kg bw/d.	See discussion below.
Agrichem	0.1	3-generation study in rats, NOEL 10 mg/kg bw/d.	Based on published literature. Study not identified. Much higher NOELs have been established in more recent reproduction studies.
Alkaloida	0.06	12-month study in dogs, NOAEL: 300 ppm (5.79 - 14.62 mg/kg bw/d).	Supplementary study, NOAEL = highest dose tested.
Barclay	0.3	Chronic study in rats (NOEL 31 mg/kg bw/d) and 3-generation study in rats (NOEL 30 mg/kg bw/d) with reference to 1986 JMPR evaluation.	No original studies. In both cases, the NOELs were the highest doses tested. Both studies were considered supplementary only.
Feinchemie	0.05	Chronic study in rats, NOEL: 100 ppm (ca 5.5 mg/kg bw/d).	Interim report conclusion.
Herbex	-	Proposal for an ADI not submitted; appropriate studies not performed.	-
Luxan	0.15	Carcinogenicity study in mice (NOAEL 150 ppm, ca 15 mg/kg bw/d) and 3-generation study in rats (NOEL 300 ppm, ca 15 mg/kg bw/d).	Supplementary studies. In the reproduction study, NOEL = highest dose tested. Much higher NOELs have been established in more recent long-term and reproduction studies.
Nufarm	-	No toxicological data submitted.	-
Sanachem	0.3	Published literature.	It is assumed that this value refers to the JMPR evaluation in 1986 (i.e. ADI derived from a long-term rat study).
SCC/I.Pi.Ci.	-	Proposal for an ADI not submitted; appropriate studies not performed.	The company refers to the database of other notifiers.
Sinon [Shinung]	0.3	Published literature.	It is assumed that this value refers to the JMPR evaluation in 1986 (i.e. ADI derived from a long-term rat study).
Rapporteur	0.3	Summary of long-term studies in rats.	See discussion below.

Source: BVL, Germany. 1998. Monograph on Glyphosate.



## Monsanto and EPA Claim Roundup and Glyphosate Are Perfectly Safe: Science Says Otherwise

### Roundup Formula 125 Times More Toxic than Glyphosate Alone

For decades, Monsanto has publicly claimed that glyphosate was perfectly safe and the company's Roundup herbicide formulations are: *"tough on plants, but no more toxic to people and animals than table salt"* or *"practically non-toxic."*<sup>93</sup>

However, an increasing number of independent peer-reviewed studies have proven that glyphosate is not the most toxic ingredient in Monsanto's Roundup formulation.<sup>94 95</sup> Glyphosate is never applied to farmers' fields by itself. Instead, pesticide manufacturers create chemical formulations with added ingredients, called "inerts" or "adjuvants," that are needed to penetrate the plant's cell walls to deliver glyphosate into the plant's growth structure. There it works to block the synthesis of three aromatic amino acids essential for growth and makes the plant susceptible to disease and "soil borne fungal pathogens."<sup>96 97</sup>

According to an independent peer reviewed study published in the *International Journal of Environmental Research and Public Health* in 2014, scientists found that Roundup was 125 times more toxic than glyphosate alone:

*"It is commonly believed that Roundup is among the safest pesticides. This idea is spread by manufacturers, mostly in the reviews they promote..., which are often cited in toxicological evaluations of glyphosate-based herbicides. However, Roundup was found in this experiment to be 125 times more toxic than glyphosate. Moreover, despite its reputation, Roundup was by far the most toxic among the herbicides and insecticides tested. This inconsistency between scientific fact and industrial claim may be attributed to huge economic interests, which have been found to falsify health risk assessments and delay health policy decisions."*<sup>98</sup>

As a result of new and emerging research, several European countries have not only banned Roundup and glyphosate for use in public parks or sale for home gardens, but the German and French governmental health and safety agencies have forced pesticide manufacturers to remove at least one inert ingredient or "co-formulant" from Monsanto's Roundup Classic and Roundup Original formulas.<sup>99</sup>

For decades, the dangerous chemical known as polyethoxylated tallow amine (POEA), which is derived from animal fat, was a central ingredient in Monsanto's Roundup formula, making up to 15% of

the Roundup Original chemical mixture. As early as 2009 the prestigious *Scientific American* magazine reported that research scientists had found that:

**POEA was more deadly to human embryonic, placental and umbilical cord cells than the herbicide itself** – a finding the researchers call "astonishing."<sup>100</sup>

According to the 2009 study, published in *Chemical Research in Toxicology*, "Moreover, the proprietary mixtures available on the market could cause cell damage and even death [at the] residual levels" found on Roundup-treated crops, such as soybeans, alfalfa, corn, and lawns and gardens.<sup>101</sup>

*Scientific American* further reported concerns from a team of research scientists, who **"suspects that Roundup might cause pregnancy problems by interfering with hormone production, possibly leading to abnormal fetal development, low birth weights or miscarriages."**

Despite these concerns and the mounting scientific evidence of likely harm from Monsanto's Roundup formulas, regulators at the USDA and EPA have failed to incorporate this new research into their consideration of Roundup's potential toxicity.

## Glyphosate Bio-Accumulates in Major Organs and Bones

While Monsanto and U.S. regulatory agencies routinely claim that glyphosate is excreted quickly from the body, a number of studies in Europe have discovered higher levels of glyphosate residue found in cows raised in countries where GMO feed was allowed (Denmark) and significantly lower in areas considered "GM free" (Germany).<sup>102</sup>

Despite Monsanto's repeated claim that glyphosate does not bio-accumulate,<sup>103</sup> this 2014 study found glyphosate residues in multiple organs of slaughtered cows, including the intestine, liver, muscles, kidney and spleen, bringing into question Monsanto's claim that glyphosate is rapidly excreted and does not bio-accumulate in animals or humans.

Beyond accumulation in vital organs, glyphosate has also been found to accumulate in bones due to its strong chelating activity or ability to bind with calcium. According to the EPA's own internal documents, reporting on corporate-paid studies submitted by Monsanto, a significant portion of glyphosate is absorbed into the bones of mice and rats used in laboratory experiments.

In 1993, in the EPA's Reregistration Eligibility Decision (RED) on Glyphosate as reported by the Office of Prevention, Pesticides and Toxic Substances: "Less than 1.0% of the absorbed dose remained in tissues and organs, primarily in bone tissue."<sup>104</sup> The real question remains, what impact

does this steady accumulation in bone tissue have on human health?

**In a study on humans and livestock, scientists found that “chronically ill humans had significantly higher glyphosate residues in urine than healthy humans”** and also discovered that humans who ate conventional diets had much higher glyphosate residues than those who ate organic food.

According to the 2014 peer reviewed study published in the *Journal of Environmental & Analytical Toxicology*:

*“Glyphosate was significantly higher in humans [fed] conventional [food] compared with predominantly organic [fed] humans. Also the glyphosate residues in urine were grouped according to the human health status. Chronically ill humans had significantly higher glyphosate residues in urine than healthy humans.”<sup>105</sup>*

If these new findings weren’t disturbing enough, a series of recent independent peer-reviewed studies found that low doses of Roundup or glyphosate-based herbicides were likely to damage the liver and kidneys of rats at ultra-low dose levels “in the range of what are now generally considered ‘safe’ for humans.”<sup>106</sup>

New scientific evidence of the harm from glyphosate continues to emerge at an almost dizzying pace, with concern in the scientific community linking Monsanto’s most widely used weedkiller to endocrine disruption, disturbance of normal gut bacteria, autoimmune diseases, birth defects, reproductive problems, infertility and even potential antibiotic resistance.

New research is finding that some autoimmune and chronic inflammatory disorders such as rheumatoid arthritis are associated<sup>107</sup> in other studies with an increased risk of certain types of cancer, including non-Hodgkin’s lymphoma, which was correlated with glyphosate exposure in the assessment by the World Health Organization’s cancer agency IARC.<sup>108</sup> These findings raise the possibility that rheumatoid arthritis and non-Hodgkin’s lymphoma share a common causative factor.<sup>109 110</sup>

For more than four decades, Monsanto has claimed that glyphosate did not bioaccumulate in animals or humans in any significant way, but a review of a 2004 joint report on pesticide residues in food by the United Nations Food and Agriculture Program and the World Health Organization determined that glyphosate does accumulate in the bones of lab animals.

*“Analysis of individual tissues demonstrated that bone contained the highest concentration of [14C] glyphosate equivalents (0.3–31ppm). The remaining tissues contained glyphosate*

*equivalents at a concentration of between 0.0003 and 11ppm (Table 3). In the bone and some highly perfused tissues, levels were statistically higher in males than in females.”<sup>111</sup>*

The question is, since non-Hodgkin’s lymphoma is a cancer that starts in cells called lymphocytes, which are part of the body’s immune system and can be found in bone marrow, what impact does this daily exposure to increasing levels of glyphosate residues have on the American public, which relies on a diet of processed foods, more than 75 percent of which contain genetically engineered ingredients that were sprayed with high levels of Roundup, Monsanto’s flagship weedkiller?

Despite Monsanto’s repeated claims of Roundup’s safety, the company was successfully sued by the New York state’s attorney general in 1996 over its use of “false and misleading advertising,” which forced the company to stop claiming its weedkiller was “biodegradable” and to halt ads that claimed Roundup was “safer than table salt” and “practically non-toxic”.<sup>112</sup>

A similar lawsuit was filed in France that resulted in a former chairman of Monsanto Agriculture France being “found guilty of false advertising for presenting Roundup as biodegradable and claiming that it left the soil clean after use” and a small fine for Monsanto’s French distributor.<sup>113</sup>

## Peer-Reviewed Science on Glyphosate

There are many independent peer-reviewed studies that show the damage caused by glyphosate to human, animal and environmental health. Many of these studies can be found [here](#).

Some of the most important studies and reviews are summarized below:

### Cancer

- The teratogenic potential of the herbicide glyphosate-Roundup in Wistar rats. <https://www.ncbi.nlm.nih.gov/pubmed/12765238>
- Two long-term studies on rats indicating possible carcinogenic effects already existed at this time. These long-term studies on rats were conducted in 1979–1981 and 1988–1990. <http://www.inchem.org/documents/ehc/ehc/ehc159.htm>

### Human Epidemiological Studies Confirming Cancer Risk

Studies in human populations have found an association between Roundup exposure and two types of blood cancer:

- An epidemiological study of pesticide



applicators in the USA found that exposure to glyphosate herbicide was associated with higher incidence of multiple myeloma. <http://www.ncbi.nlm.nih.gov/pubmed/15626647>

- Epidemiological studies conducted in Sweden found that exposure to glyphosate herbicide was linked with a higher incidence of non-Hodgkin's lymphoma. <http://onlinelibrary.wiley.com/doi/10.1002/%28SICI%291097-0142%2819990315%2985:6<1353::AID-CNCR19>3.0.CO;2-1/full>
- A systematic review of the literature published in 2014 concluded that there was an association between exposure to glyphosate herbicides and non-Hodgkin's Lymphoma. <https://www.ncbi.nlm.nih.gov/pubmed/24762670>

### Endocrine Disruption (Hormone Hacking)

- Glyphosate herbicide was a potent EDC in rats, causing disturbances in reproductive development after exposure during puberty. <https://www.ncbi.nlm.nih.gov/pubmed/20012598>
- This new Argentine study is the first to show endocrine-disrupting effects of a glyphosate-based herbicide on the uterus of newborn and pre-pubertal rats, supporting the possibility

that glyphosate-based herbicides are endocrine disruptors. <http://www.sciencedirect.com/science/article/pii/S0300483X16300932>

- An in vivo study of Roundup administered to rats in drinking water diluted to 50ng/L glyphosate equivalence – half of the level permitted in drinking water in the EU and 14,000 times lower than that permitted in drinking water in the USA – resulted in severe organ damage and a trend of increased incidence of mammary tumors in female animals over a 2-year period of exposure. The latter observation of tumors needs to be confirmed in an experiment with larger numbers of rats. <http://enveurope.springeropen.com/articles/10.1186/s12302-014-0014-5>

### Kidney and Liver Damage at Low Doses

- A ground-breaking peer-reviewed study published in Environmental Health Journal in 2015 shows the levels of glyphosate-based herbicides which the general public are commonly exposed to in drinking water, altered the gene function of over 4000 genes in the livers and kidneys of rats. <http://ehjournal.biomedcentral.com/articles/10.1186/s12940-015-0056-1>



## Binding of Vital Nutrients

- Glyphosate binds (chelates) vital nutrients such as iron, manganese, zinc, and boron in the soil, preventing plants from taking them up. <https://core.ac.uk/download/pdf/11741277.pdf?repositoryId=393>
- Genetically Modified (GM) soy plants treated with glyphosate have lower levels of essential nutrients and reduced growth, compared with GMO and non-GMO soy controls not treated with glyphosate. <http://link.springer.com/article/10.1007%2Fs11104-009-0081-3>

## Antibiotic Resistance

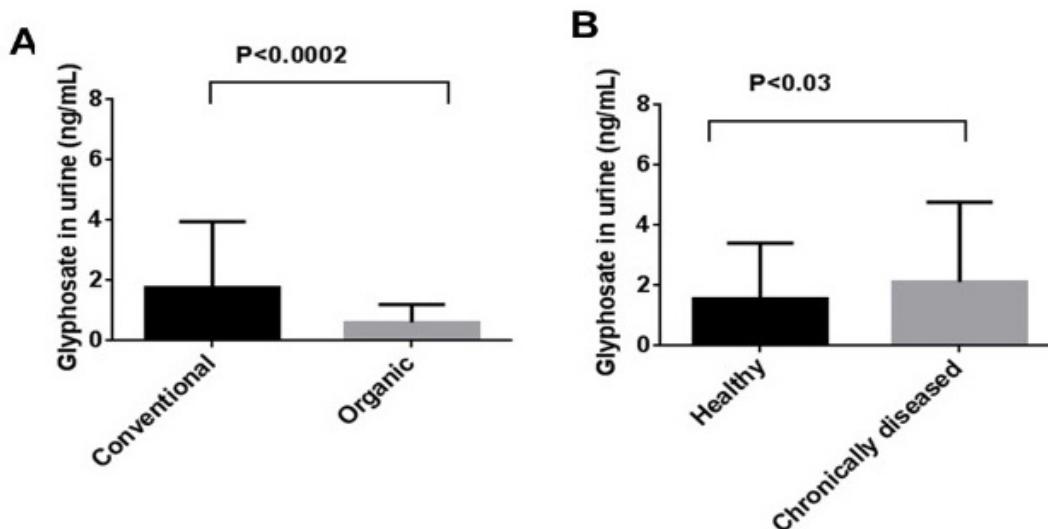
- Research lead by a team from the University of Canterbury, New Zealand found that commonly used herbicides, including Roundup, can cause bacteria to become resistant to antibiotics. <http://mbio.asm.org/content/6/2/e00009-15>

## For Reference: Allowed Levels of Glyphosate in Drinking Water

- Council of the European Union. Council directive 98/83/EC of 3 November 1998 on the quality of water intended for human consumption. Off J Eur Communities. 1998. <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:1998:330:0032:0054:EN:PDF>
- US Environmental Protection Agency (EPA). Basic information about glyphosate in drinking water. 2014. <https://www.epa.gov/ground-water-and-drinking-water/table-regulated-drinking-water-contaminants>



## Glyphosate Exposure Levels in Humans: Healthy and Chronically Diseased



**Figure 3:** Glyphosate in humans. A) Comparison of glyphosate excretion with urine of humans with conventional (N=99) and predominantly organic (N=41) feeding. B) Glyphosate in healthy (N=102) and chronically (N=199) diseased humans.

**Source:** Krüger M, 2014.



## How to Avoid Glyphosate

After reading this report, which confirms glyphosate contamination in our food supply, as well as findings of glyphosate in drinking water, rain and the air, the first question you might ask yourself, is how can I avoid unwanted glyphosate residues in my, or my family's, daily meals?

The results presented in this report are the first round of independent testing of common American food products. This report uses the regulatory recognized “gold standard” testing methods of an FDA registered laboratory. While we are alarmed at the results found in a wide range of popularly consumed foods, we simply cannot say with certainty what levels of glyphosate residue are actually in the food supply.

These unprecedented pesticide residue tests confirm that glyphosate contamination is widespread. Not only do high levels of glyphosate residues show up in obvious GMO products, but they are also present in foods that are not genetically engineered. Glyphosate residues are now found in food crops, such as wheat, oats and barley, where glyphosate is used as a pre-harvest drying agent.

### High Glyphosate Levels as a Result of Pre-Harvest Spraying of Roundup

In this initial round of testing, the two highest glyphosate residue levels were found on products that intentionally do not contain GMO ingredients and proudly boast their Non-GMO status on the packaging.

In the case of *Cheerios*, General Mills removed GMOs from their iconic cereal in 2014 and now market

the popular cereal as “*Not made with genetically engineered ingredients*” and also “gluten free.” Unfortunately, the practice of pre-harvest spraying of Roundup on *Cheerios* number one ingredient “whole grain oats,” has resulted in the highest levels of glyphosate contamination, which poses health concerns for young children consuming this food on a daily basis.

The next highest level was found in *Stacy's Simply Naked Pita Chips*, which contain no GMO ingredients and are actually certified by a third party, *the Non-GMO Project*, which test for GMO contamination levels, but not pesticide residues.

This report reveals that glyphosate use is widespread and moves freely in the environment. Even the two organic products that were tested as controls found glyphosate contamination. Obviously more testing is needed.

### An Organic Diet for 1 Week Reduces Pesticide Exposures by 90%

Since GMOs and Roundup are both prohibited from organic production, the simplest way to avoid glyphosate contamination in food and to reduce exposures to synthetic pesticides is to eat organic food.

A 2014 study published in the *Journal of Environmental Research* confirmed that families eating an organic diet for as little as a week removed more than 90% of the pesticides from their system, as detected through urine tests.<sup>114</sup> According to this independent study, “the average person is exposed to 10 to 13 pesticide residues each day from food, beverages and drinking water.”



## Call to Action:

### Based on these scientific findings, Food Democracy Now! is calling for:

1. A federal investigation into the likely harmful effects of glyphosate on human health and the environment as a result of these disturbingly high levels of glyphosate residues found in popular American food products.
2. The EPA to refuse to reapprove glyphosate until the most current scientific evidence can be reviewed in an open and transparent process.
3. A permanent ban on the use of glyphosate as a pre-harvest drying agent for crops such as dry beans, sunflowers, wheat, oats and barley.
4. The immediate release of all restricted, allegedly “trade secret” data from all previous industry studies on glyphosate and glyphosate-based herbicides by the relevant federal agencies, including the Environmental Protection Agency (EPA), the Food and Drug Administration (FDA) and the U.S. Department of Agriculture (USDA).

### Demand Immediate Release of Industry Science Data; End Pre-Harvest Spraying on Wheat, Oats, Barley and other Food Crops!

Today FOOD DEMOCRACY NOW! is calling for an immediate release by the EPA, FDA and USDA of all the data from corporate controlled scientific studies. Monsanto and other pesticide manufacturers are legally allowed to keep this information from the public and scientific community at large, based on the notion of “trade secrets,” which since glyphosate’s original patent expired is no longer a valid justification.

This lack of scientific integrity is alarming. Hiding fundamental research data from the public and the scientific community is a threat to public health. It undermines trust in the safety of our food supply, our federal government and the regulatory agencies that are supposed to be looking out for the wellbeing of the American public.

### Urgent Need for Fundamental Reforms of Scientific Review Process

U.S. and European regulators and the chemical companies that supply them with corporate-sponsored research may try to dismiss these findings. However, a growing body of new independent, peer-reviewed scientific research continues to show disturbing evidence of harm from Roundup and glyphosate, at what were previously considered safe or extremely low doses. The evidence shows that Roundup and glyphosate are

far more toxic than was generally believed during the original scientific reviews of glyphosate’s safety in the 1970s and 1980s.

Since that time, new scientific understandings of the real harm that chemicals can cause at low levels, such as the toxic effects of endocrine disruption, has emerged and must be considered in any new review of Roundup and glyphosate re-authorizations.



### For comments on this report please contact:

**David Murphy,**  
**Executive Director, Food Democracy Now!**  
[www.fooddemocracynow.org](http://www.fooddemocracynow.org), [dave@fooddemocracynow.org](mailto:dave@fooddemocracynow.org)

**Henry Rowlands,**  
**Director, The Detox Project**  
[www.detoxproject.org](http://www.detoxproject.org), [henry@detoxproject.org](mailto:henry@detoxproject.org)

**Food Democracy Now!:**  
[www.fooddemocracynow.org](http://www.fooddemocracynow.org)

Food Democracy Now! is a grassroots movement of more than 650,000 farmers and citizens dedicated to building a sustainable food system that protects our natural environment, sustains farmers and nourishes families.

We know we can build a food system that gives our communities equal access to healthy food, and respects the dignity of the farmers who produce it. We believe in recreating regional food systems, supporting the growth of humane, natural and organic farms, and protecting the environment. We value our children’s health, worker’s rights, conservation, and animal welfare over corporate profits. We believe that working together, we can make this vision a reality in our lifetimes.

**The Detox Project:**  
[www.detoxproject.org](http://www.detoxproject.org)

The Detox Project is a research platform that brings awareness to the public by testing for man-made chemicals in our bodies and in our food at a very personal level.

We believe you have the right to know what man-made chemicals are in your body and in your food!



## About the Authors

### David Murphy

Dave is the founder and executive director of Food Democracy Now!, a grassroots movement of more than 650,000 American farmers and citizens dedicated to reforming policies relating to food, agriculture and the environment.

In 2006, Murphy moved back to Iowa to help stop a factory farm from being built near his sister's farm. After seeing the loss of basic democratic rights of rural Iowans, Murphy decided to stay in Iowa to fight for Iowa's farmers and rural residents and expose the flaws of industrial agriculture to help create a more sustainable future for all Americans.

In 2012, Murphy served as the co-chair of California's Prop 37, a ballot initiative to label genetically engineered foods. Following a narrow loss, Murphy helped write and pass the first two GMO labeling bills in Connecticut and Maine in 2013. His writing has appeared in *The Nation*, *The Hill*, *The Huffington Post* and *The New York Times*.

### Henry Rowlands

Henry was brought up on a family run organic sheep farm in the Pembrokeshire National Park in Wales. His connection to both farming and the protection of the Welsh countryside led to a deep interest in issues related to sustainable agriculture from a young age.

Following work as a Journalist in many countries across Europe, Henry moved on to set up one of the World's most successful Sustainable Agriculture online news sources "Sustainable Pulse" which focuses on GMOs and pesticides. Sustainable Pulse now has a regular readership of over 100,000 people per month from over 125 countries.

Sustainable Pulse is also involved in a number of reference projects, all of which have the aim of educating the public on the problems surrounding the overuse of pesticides. These include The Detox Project, which has set up a unique pesticide testing platform across America.



# References

- 1 "Acreage for Genetically Modified Crops Declined in 2015," *The New York Times*, April 13, 2016 <http://www.nytimes.com/2016/04/13/business/acreage-for-genetically-modified-crops-declined-in-2015.html>.
- 2 Mesnage R, Arno M, Costanzo M, Malatesta M, Seralini GE, Antoniou MN. Transcriptome profile analysis reflects rat liver and kidney damage following chronic ultra-low dose Roundup exposure. *Environ Health*. 2015;14:70. <http://ehjournal.biomedcentral.com/articles/10.1186/s12940-015-0056-1>.
- 3 Uren Webster TM, Santos EM. Global transcriptomic profiling demonstrates induction of oxidative stress and of compensatory cellular stress responses in brown trout exposed to glyphosate and Roundup. *BMC Genomics* 2015 Jan 31;16:32. PMID: 25636363 <http://bmcbgenomics.biomedcentral.com/articles/10.1186/s12864-015-1254-5>.
- 4 Larsen K, Najle R, Lifschitz A, Virkel G. Effects of sub-lethal exposure of rats to the herbicide glyphosate in drinking water: glutathione transferase enzyme activities, levels of reduced glutathione and lipid peroxidation in liver, kidneys and small intestine. *Environ Toxicol Pharmacol*. 2012;34:811-8. doi: 10.1016/j.etap.2012.09.005. <https://www.ncbi.nlm.nih.gov/pubmed/23044091>.
- 5 Uren Webster TM, Santos EM. Global transcriptomic profiling demonstrates induction of oxidative stress and of compensatory cellular stress responses in brown trout exposed to glyphosate and Roundup. *BMC Genomics* 2015 Jan 31;16:32. PMID: 25636363 <http://bmcbgenomics.biomedcentral.com/articles/10.1186/s12864-015-1254-5>.
- 6 Antoniou M et al. Teratogenic effects of glyphosate-based herbicides: Divergence of regulatory decisions from scientific evidence. *Journal of Environmental and Analytical Toxicology* 2012, 5:4. <http://www.omicsonline.org/teratogenic-effects-of-glyphosate-based-herbicides-divergence-of-regulatory-decisions-from-scientific-evidence-2161-0525.S4-006.pdf>
- 7 United States Patent 3,160,632 (1964) Stauffer Chemical: <http://1.usa.gov/1BULTJj>
- 8 United States Patent 3,799,758 (1974) Franz, Assignee Monsanto: <http://1.usa.gov/1BZlu02>
- 9 "How Much Money Does Monsanto Make From Roundup?," *The Motley Fool*, May 26, 2016. <http://www.fool.com/investing/2016/05/26/how-much-money-does-monsanto-make-from-roundup.aspx>.
- 10 Cakmak I, Yazici A, Tutus Y, Ozturk L. Glyphosate reduced seed and leaf concentrations of calcium, manganese, magnesium, and iron in non-glyphosate resistant soybean. *Eur J Agron*. 2009;31:114-119.
- 11 Neumann G, Kohls S, Landsberg E, Stock-Oliveira Souza K, Yamada T, Romheld V. Relevance of glyphosate transfer to non-target plants via the rhizosphere. *J Plant Dis Prot*. 2006;20:963-969.
- 12 Huber DM. What about glyphosate-induced manganese deficiency? *Fluid J*. 2007;20-22.
- 13 Bott S, Tesfamariam T, Candan H, Cakmak I, Römheld V, Neumann G. Glyphosate-induced impairment of plant growth and micronutrient status in glyphosate-resistant soybean (*Glycine max* L.). *Plant Soil*. 2008;312(1-2):185-194. doi:10.1007/s1104-008-9760-8.
- 14 Zobiole LH, de Oliveira RS, Visentainer JV, Kremer RJ, Bellaloui N, Yamada T. Glyphosate affects seed composition in glyphosate-resistant soybean. *J Agric Food Chem*. 2010;58:4517-22. doi:10.1021/jf904342t.
- 15 Zobiole LHS, de Oliveira RS, Huber DM, et al. Glyphosate reduces shoot concentrations of mineral nutrients in glyphosate-resistant soybeans. *Plant Soil*. 2010;328:57-69.
- 16 Kremer, R. J.; Means, N. E. Glyphosate and glyphosate resistant crop interactions with rhizosphere microorganisms. *Eur. J. Agron*. 2009, 31, 153-161.
- 17 Krüger M, Schrödl W, Neuhaus J, Shehata AA. Field investigations of glyphosate in urine of Danish dairy cows. *J Env Anal Toxicol*. 2013;3(5). doi: <http://dx.doi.org/10.4172/2161-0525.1000186>.
- 18 United States Patent 7,771,736 (2010) Abraham, Assignee Monsanto: <http://1.usa.gov/1IEMmWz>
- 19 Benbrook, C. *Trends in the use of glyphosate herbicide in the U.S. and globally*. *Environmental Sciences Europe*. 2015;28(3). <http://enveurope.springeropen.com/articles/10.1186/s12302-016-0070-0>.
- 20 "Glyphosate Now the Most-Used Agricultural Chemical Ever," February 2, 2016, *Newsweek* <http://www.newsweek.com/glyphosate-now-most-used-agricultural-chemical-ever-422419>.
- 21 Glyphosate Map of America, Detox Project, Estimated Agricultural Use 1992 thru 2012. Source: USGS, Pesticide National Synthesis Project., <http://detoxproject.org/glyphosate-map-of-america/>.
- 22 National Water-Quality Assessment (NAWQA) Program, Pesticide National Synthesis Project, Estimated Agricultural Use for Glyphosate 1992 to 2013. [https://water.usgs.gov/nawqa/pnsp/usage/maps/show\\_map.php?year=2013&map=GLYPHOSATE&hilo=L](https://water.usgs.gov/nawqa/pnsp/usage/maps/show_map.php?year=2013&map=GLYPHOSATE&hilo=L).
- 23 USDA ERS (2015). Adoption of genetically engineered crops in the U.S. USDA Economic Research Service. <http://www.ers.usda.gov/data-products/adoption-of-genetically-engineered-crops-in-the-us/recent-trends-in-ge-adoption.aspx>.
- 24 "U.S. researchers find Roundup chemical in water, air," August 31, 2011, Reuters <http://www.reuters.com/article/us-glyphosate-pollution-idUSTRE77U61720110831>.
- 25 Chang FC, Simcik MF, Capel PD. 2011. Occurrence and fate of the herbicide glyphosate and its degradate aminomethylphosphonic acid in the atmosphere. *Environ Toxicol Chem* 30:548-555. <http://dx.doi.org/10.1002/etc.431>.
- 26 Coupe RH, Capel PD: Trends in pesticide use on soybean, corn and cotton since the introduction of major genetically modified crops in the United States. *Pest Manag Sci* 2015.
- 27 "EPA tosses aside safety data, says Dow pesticide for GMOs won't harm people," December 8, 2015, Chicago Tribune. <http://www.chicagotribune.com/news/watchdog/ct-gmo-crops-pesticide-resistance-met-20151203-story.html>.
- 28 "Why is Glyphosate Sprayed on Crops Right Before Harvest?," March 5, 2016, EcoWatch. <http://www.ecowatch.com/why-is-glyphosate-sprayed-on-crops-right-before-harvest-1882187755.html>.
- 29 Hird, S.J. et al, Liquid chromatography-mass spectrometry for the determination of chemical contaminants in food, *TrAC Trends Anal. Chem*. 59 (2013) 59-72. <http://www.sciencedirect.com/science/article/pii/S0165993614000971>.
- 30 "Glyphosate Testing Revolution - The New Science, Sustainable Pulse, April 20, 2016. [http://sustainablepulse.com/2016/04/20/a-guide-to-the-glyphosate-testing-revolution/#.V\\_mePWZSk1l](http://sustainablepulse.com/2016/04/20/a-guide-to-the-glyphosate-testing-revolution/#.V_mePWZSk1l).
- 31 ResearchGate, Best method to detect pesticide (exposure) in blood samples, July 15, 2014. [https://www.researchgate.net/post/Can\\_anyone\\_suggest\\_which\\_is\\_the\\_best\\_method\\_to\\_detect\\_pesticide\\_exposure\\_in\\_blood\\_samples](https://www.researchgate.net/post/Can_anyone_suggest_which_is_the_best_method_to_detect_pesticide_exposure_in_blood_samples).
- 32 "FDA to Start Testing for Glyphosate in Food," February 17, 2016, Time. <http://time.com/4227500/fda-glyphosate-testing/>.
- 33 "Roundup Chemical Glyphosate Found in 93% of Americans," About Lawsuits, June 1, 2016 <http://www.aboutlawsuits.com/roundup-chemical-glyphosate-testing-102183/>.
- 34 "Greens warn: German breast milk unsafe," June 26, 2016, The Local de. <http://www.thelocal.de/20150626/concerns-over-safety-of-german-breast-milk>.
- 35 "Cancer-linked pesticide found in popular German beer," February 26, 2016, RT. <https://www.rt.com/news/333679-cancer-pesticide-beer-germany/>.
- 36 "85% of Tampons Contain Monsanto's 'Cancer Causing' Glyphosate," October 26, 2015. <http://www.ecowatch.com/85-of-tampons-contain-monsantos-cancer-causing-glyphosate-1882112780.html>
- 37 "150 European Parliament Members to Test Urine for Glyphosate," EcoWatch, April 11, 2016. <http://www.ecowatch.com/150-european-parliament-members-to-test-urine-for-glyphosate-1891081633.html>.
- 38 (PRiF) UDECoPRiF: Monitoring program. <http://www.food.gov.uk/business-industry/farmingfood/pesticides>.
- 39 Agricultural Marketing Service. Pesticide data program annual summary, program year 2011. In: Appendix C Distribution of Residues in Soybean by Pesticide. Washington, D.C: U.S. Department of Agriculture; 2013.
- 40 EPA, Drinking Water Contaminants - Standards and Regulations, Table of Regulated Drinking Water Contaminants, What are glyphosate's health effects?. <https://safewater.zendesk.com/hc/en-us/articles/211402278-3-What-are-glyphosate-s-health-effects->.
- 41 Mesnage R, Arno M, Costanzo M, Malatesta M, Seralini GE, Antoniou MN. Transcriptome profile analysis reflects rat liver and kidney damage following chronic ultra-low dose Roundup exposure. *Environ Health*. 2015;14:70. <http://ehjournal.biomedcentral.com/articles/10.1186/s12940-015-0056-1>.
- 42 Seralini GE, Clair E, Mesnage R, Gress S, Defarge N, Malatesta M, et al. Republished study: long-term toxicity of a Roundup herbicide and a Roundup-tolerant genetically modified maize. *Environ Sci Europe*. 2014;26:14. <http://enveurope.springeropen.com/articles/10.1186/s12302-014-0014-5>.

- 43 Uren Webster TM, Santos EM. Global transcriptomic profiling demonstrates induction of oxidative stress and of compensatory cellular stress responses in brown trout exposed to glyphosate and Roundup. *BMC Genomics* 2015 Jan 31;16:32. PMID: 25636363 <http://bmcbgenomics.biomedcentral.com/articles/10.1186/s12864-015-1254-5>.
- 44 Larsen K, Najle R, Lifschitz A, Virkel G. Effects of sub-lethal exposure of rats to the herbicide glyphosate in drinking water: glutathione transferase enzyme activities, levels of reduced glutathione and lipid peroxidation in liver, kidneys and small intestine. *Environ Toxicol Pharmacol*. 2012;34:811-8. doi: 10.1016/j.etap.2012.09.005. <https://www.ncbi.nlm.nih.gov/pubmed/23044091/>.
- 45 EPA, Drinking Water Contaminants – Standards and Regulations, Table of Regulated Drinking Water Contaminants. <https://www.epa.gov/ground-water-and-drinking-water/table-regulated-drinking-water-contaminants#inorganic>.
- 46 "Great Glyphosate Rebellion Continues as Europe Refuses Temporary License Extension," Sustainable Pulse, June 6, 2016. [http://sustainablepulse.com/2016/06/06/great-glyphosate-rebellion-continues-as-europe-refuses-temporary-license-extension/#.V\\_b8m2ZSI6l](http://sustainablepulse.com/2016/06/06/great-glyphosate-rebellion-continues-as-europe-refuses-temporary-license-extension/#.V_b8m2ZSI6l).
- 47 "U.S. lawsuits build against Monsanto over alleged Roundup cancer link," Reuters, October 15, 2015. <http://www.reuters.com/article/us-usa-monsanto-lawsuits-idUSKCN0S92H720151015>.
- 48 "What Killed Jack McCall? A California Farmer Dies and a Case Against Monsanto Takes Root," Huffington Post, May 6, 2016 [http://www.huffingtonpost.com/carey-gillam/what-killed-jack-mccall-a\\_b\\_9852216.html](http://www.huffingtonpost.com/carey-gillam/what-killed-jack-mccall-a_b_9852216.html).
- 49 Monsanto Roundup Lawsuit, Baum, Hedlund, Aristei and Goldman. <https://www.baumhedlundlaw.com/toxic-tort-law/monsanto-roundup-lawsuit/>.
- 50 "Health costs of hormone disrupting chemicals over €150bn a year in Europe, says study," The UK Guardian, March 6, 2015. <https://www.theguardian.com/environment/2015/mar/06/health-costs-hormone-disrupting-chemicals-150bn-a-year-europe-says-study>.
- 51 Cakmak, I.; Yazici, A.; Tutus, Y.; Ozturk, L. Glyphosate reduced seed and leaf concentrations of calcium, manganese, magnesium, and iron in non-glyphosate resistant soybean. *Eur. J. Agron*. 2009, 31, 114-119. <http://research.sabanciuniv.edu/13147/>.
- 52 Kurenbach B, Marjoshi D, Amabile-Cuevas CF, Ferguson GC, Godsoe W, Gibson P, Heinemann JA et al. Sublethal exposure to commercial formulations of the herbicides dicamba, 2,4-dichlorophenoxyacetic acid, and glyphosate cause changes in antibiotic susceptibility in *Escherichia coli* and *Salmonella enterica* serovar typhimurium. *mBio*. 2015;6:2. <http://mbio.asm.org/content/6/2/e00009-15>.
- 53 Glyphosate: not JUST a carcinogen, Wheat Belly Blog, Dr. William Davis, October 12, 2015 <http://www.wheatbellyblog.com/2015/10/glyphosate-not-just-a-carcinogen/>.
- 54 Krüger M, Shehata AA, Schrödl W, Rodloff A. Glyphosate suppresses the antagonistic effect of *Enterococcus* spp. on *Clostridium botulinum*. *Anaerobe* 2013;20:74-78. <https://www.ncbi.nlm.nih.gov/pubmed/23396248>.
- 55 Shehata AA, Schrödl W, Aldin AA, Hafez HM, Kruger M. The effect of glyphosate on potential pathogens and beneficial members of poultry microbiota in vitro. *Curr Microbiol*. 2013;66(4):350-8. <http://link.springer.com/article/10.1007%2F00284-012-0277-2>.
- 56 Vandenberg LN, Colborn T, Hayes TB, Heindel JJ, Jacobs DR, Lee DH, et al. Regulatory decisions on endocrine disrupting chemicals should be based on the principles of endocrinology. *Reprod Toxicol*. 2013;38C:1-15. <https://www.ncbi.nlm.nih.gov/pubmed/22419778>.
- 57 Thongprakaisang S, Thiantanawat A, Rangkadilok N, Suriyo T, Sata-yavivad J. Glyphosate induces human breast cancer cells growth via estrogen receptors. *Food Chem Toxicol*. 2013;59C:129-36. <http://europepmc.org/abstract/med/23756170>.
- 58 Seralini GE, Clair E, Mesnage R, Gress S, Defarge N, Malatesta M, et al. Republished study: long-term toxicity of a Roundup herbicide and a Roundup-tolerant genetically modified maize. *Environ Sci Europe*. 2014;26:14. <https://enveurope.springeropen.com/articles/10.1186/s12302-014-0014-5>.
- 59 Vandenberg LN, Colborn T, Hayes TB, Heindel JJ, Jacobs DR, Lee DH, et al. Regulatory decisions on endocrine disrupting chemicals should be based on the principles of endocrinology. *Reprod Toxicol*. 2013;38C:1-15. <https://www.ncbi.nlm.nih.gov/pubmed/22419778>.
- 60 Mesnage R, Bernay B, Seralini GE. Ethoxylated adjuvants of glyphosate-based herbicides are active principles of human cell toxicity. *Toxicology*. 2013;313(2-3):122-8. <http://europepmc.org/abstract/MED/23000283>.
- 61 Antoniou M, Habib MEM, Howard CV, et al. Teratogenic effects of glyphosate-based herbicides: Divergence of regulatory decisions from scientific evidence. *J Env Anal Toxicol*. 2012;S4:006. doi:10.4172/2161-0525.S4-006.
- 62 Romano RM, Romano MA, Bernardi MM, Furtado PV, Oliveira CA. Prepubertal exposure to commercial formulation of the herbicide Glyphosate alters testosterone levels and testicular morphology. *Arch Toxicol*. 2010;84:309-317.
- 63 Benedetti AL, Vituri C de L, Trentin AG, Domingues MA, Alvarez-Silva M. The effects of sub-chronic exposure of Wistar rats to the herbicide Glyphosate-Biocarb. *Toxicol Lett*. 2004;153:227-232. doi:10.1016/j.toxlet.2004.04.008.
- 64 Lee H-L, Kan C-D, Tsai C-L, Liou M-J, Guo H-R. Comparative effects of the formulation of glyphosate-surfactant herbicides on hemodynamics in swine. *Clin Toxicol Phila Pa*. 2009;47(7):651-658. doi:10.1080/15563650903158862. <https://www.ncbi.nlm.nih.gov/pubmed/22787363>.
- 65 Adam A, Marzuki A, Abdul Rahman H, Abdul Aziz M. The oral and intratracheal toxicities of ROUNDUP and its components to rats. *Vet Hum Toxicol*. 1997;39(3):147-151. <https://www.ncbi.nlm.nih.gov/pubmed/9167243>.
- 66 "Roundup: Birth Defects Caused By World's Top-Selling Weedkiller, Scientists Say," Huffington Post, June 24, 2011 [http://www.huffingtonpost.com/2011/06/24/roundup-scientists-birth-defects\\_n\\_883578.html](http://www.huffingtonpost.com/2011/06/24/roundup-scientists-birth-defects_n_883578.html).
- 67 Antoniou M, Habib MEM, Howard CV, et al. Teratogenic effects of glyphosate-based herbicides: Divergence of regulatory decisions from scientific evidence. *J Env Anal Toxicol*. 2012;S4:006. doi:10.4172/2161-0525.S4-006. <http://www.omicsonline.org/open-access/the-formation-of-doxorubicin-loaded-targeted-nanoparticles-using-nanoprecipitation-double-emulsion-and-single-emulsion-for-cancer-2157-7439-1000379.php?aid=74534>.
- 68 Rapporteur member state, Germany. 1998. Monograph on Glyphosate. Released by the German Federal Agency for Consumer Protection and Food Safety, BVL. Volume 3-1\_Glyphosat\_05.pdf <https://www.scribd.com/document/57155616/VOLUME3-1-GLYPHOSAT-05>.
- 69 Larsen K, Najle R, Lifschitz A, Virkel G. Effects of sub-lethal exposure of rats to the herbicide glyphosate in drinking water: glutathione transferase enzyme activities, levels of reduced glutathione and lipid peroxidation in liver, kidneys and small intestine. *Environ Toxicol Pharmacol*. 2012;34(3):811-818. doi:10.1016/j.etap.2012.09.005. <https://www.ncbi.nlm.nih.gov/pubmed/23044091>.
- 70 Thongprakaisang S, Thiantanawat A, Rangkadilok N, Suriyo T, Sata-yavivad J. Glyphosate induces human breast cancer cells growth via estrogen receptors. *Food Chem Toxicol*. 2013;59:129-136. doi:10.1016/j.fct.2013.05.057. <https://www.ncbi.nlm.nih.gov/pubmed/23756170>.
- 71 Attorney General of the State of New York 1996. In the Matter of Monsanto Company, Respondent. Assurance of Discontinuance Pursuant to Executive Law § 63(15). New York: Attorney General of the State of New York, Consumer Frauds and Protection Bureau, Environmental Protection Bureau.
- 72 EPA 40 CFR Part 180 [EPA-HQ-OPP-2012-0132; FRL-9384-3] Glyphosate; Pesticide Tolerances, Federal Register/ Vol. 78, No. 84 / Wednesday, May 1, 2013 / Rules and Regulations <https://www.gpo.gov/fdsys/pkg/FR-2013-05-01/pdf/2013-10316.pdf>.
- 73 Pesticide Tolerances: Glyphosate, Rule document issued by Environmental Protection Agency, Regulations dot gov, Comment Period Closed July 1 2013. <https://www.regulations.gov/document?D=EPA-HQ-OPP-2012-0132-0009>.
- 74 Benbrook C. Trends in the use of glyphosate herbicide in the U.S. and globally. *Environmental Sciences Europe*. 2015;28(3). <http://dx.doi.org/10.1186/s12302-016-0070-0>.
- 75 "EPA raises levels of glyphosate residue allowed in food," July 5, 2013, The Washington Times. <https://web.archive.org/web/20130709080009/http://communities.washingtontimes.com/neighborhood/world-our-backyard/2013/jul/5/epa-raises-levels-glyphosate-residue-allowed-your->.
- 76 Bohn T, Cuha M, Traavik T, Sanden M, Fagan J, Primicerio R (2014) Compositional differences in soybeans on the market: glyphosate accumulates in Roundup Ready GM soybeans. *Food Chem* 153:207-215 <http://www.sciencedirect.com/science/article/pii/S0308814613019201>
- 77 "How 'Extreme Levels' of Roundup in Food Became the Industry Norm," March 24, 2014, Thomas Bohn and Marek Cuhra, Independent Science. <http://www.independentsciencenews.org/news/how-extreme-levels-of-roundup-in-food-became-the-industry-norm/>



- 78 "UCSF Presentation Reveals Glyphosate Contamination in People across America," May 25, 2016, The Detox Project. <http://detoxproject.org/1321-2/>
- 79 "Glyphosate Found in Urine of 93 Percent of Americans Tested," May 29, 2016, EcoWatch. <http://www.ecowatch.com/glyphosate-found-in-urine-of-93-percent-of-americans-tested-1891146755.html>
- 80 Krüger M, Schledorn P, Schrödl W, Hoppe HW, Lutz W, et al. (2014) Detection of Glyphosate Residues in Animals and Humans. *J Environ Anal Toxicol* 4: 210.
- 81 WHO (1987). "Principles for the safety assessment of food additives and contaminants in food." *Environmental Health Criteria* 70 <http://www.inchem.org/documents/ehc/ehc/ehc70.htm#SectionNumber:5.5>
- 82 Monograph on Glyphosate. Annex B-5.10.2: Toxicology and Metabolism (1998) Released by German government agency BVL. [www.scribd.com/doc/57155616/VOLUME3-1-GLYPHOSAT-05](http://www.scribd.com/doc/57155616/VOLUME3-1-GLYPHOSAT-05)
- 83 For EPA's setting of the glyphosate ADI at 0.1 mg/kg/day in the early 1980s (vs. 1.75 today), see EPA (1983). Glyphosate (Roundup) on wheat. March 3, 1983.
- 84 "Monsanto Knew of Glyphosate Cancer Link 35 Years Ago," Sustainable Pulse, April 9, 2015 <http://sustainablepulse.com/2015/04/09/monsanto-knew-of-glyphosate-cancer-link-35-years-ago/>
- 85 EPA SECOND Peer Review of Glyphosate, The Health Effects Division (HED) Carcinogenicity Peer Review Committee (CPRC) June 26, 1991.
- 86 Rapporteur member state, Germany. 1998. Monograph on Glyphosate. Released by the German Federal Agency for Consumer Protection and Food Safety, BVL. Volume 3-1\_Glyphosat\_05.pdf <https://www.scribd.com/document/57155616/VOLUME3-1-GLYPHOSAT-05>
- 87 Rapporteur member state, Germany. 1998. Monograph on Glyphosate. Released by the German Federal Agency for Consumer Protection and Food Safety, BVL. Volume 3-1\_Glyphosat\_05.pdf <https://www.scribd.com/document/57155616/VOLUME3-1-GLYPHOSAT-05>
- 88 For EPA's setting of the glyphosate ADI at 0.1 mg/kg/day in the early 1980s (vs. 1.75 today), see EPA (1983). Glyphosate (Roundup) on wheat. March 3, 1983.
- 89 Rapporteur member state, Germany. 1998. Monograph on Glyphosate. Released by the German Federal Agency for Consumer Protection and Food Safety, BVL. Volume 3-1\_Glyphosat\_05.pdf <https://www.scribd.com/document/57155616/VOLUME3-1-GLYPHOSAT-05>
- 90 Mesnage et al. Transcriptome profile analysis reflects rat liver and kidney damage following chronic ultra-low dose Roundup exposure. *Environmental Health* 2015;14:70. <https://ehjournal.biomedcentral.com/articles/10.1186/s12940-015-0056-1>.
- 91 Antoniou M et al. Teratogenic effects of glyphosate-based herbicides: Divergence of regulatory decisions from scientific evidence. *Journal of Environmental and Analytical Toxicology* 2012, 5:4. <http://www.omicsonline.org/teratogenic-effects-of-glyphosate-based-herbicides-divergence-of-regulatory-decisions-from-scientific-evidence-2161-0525.S4-006.pdf>
- 92 "Gene expression analysis confirms Roundup causes liver and kidney damage at very low doses," GMWatch, August 25, 2015. <http://www.gmwatch.org/news/latest-news/16375-gene-expression-analysis-confirms-roundup-causes-liver-and-kidney-damage-at-very-low-doses>.
- 93 Monsanto Europe, December 1995.
- 94 Richard S, Moslemi S, Sipahutar H, Benachour N, Seralini G-E (2005) Differential effects of glyphosate and roundup on human placental cells and aromatase. *Environ Health Perspect* 113:716-720. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1257596/>.
- 95 Mesnage R, Defarge N, Spiroux de Vendômois J, Seralini GE (2014) Major pesticides are more toxic to human cells than their declared active principles. *Biomed Res Int* 2014:179691 <https://www.hindawi.com/journals/bmri/2014/179691/citations/>.
- 96 Johal, G.R. and Huber, D.M. 2009. Glyphosate effects on diseases of plants. *European J. Agron.* 31:144-152. <http://www.certifiedorganic.bc.ca/rcbtoa/services/huber-glyphosates-2009.pdf>.
- 97 "Scientist warns of dire consequences with widespread use of glyphosate," The Organic and Non-GMO Report, May 2010. [http://www.non-gmoreport.com/articles/may10/consequenceso\\_widespread\\_glyphosate\\_use.php](http://www.non-gmoreport.com/articles/may10/consequenceso_widespread_glyphosate_use.php).
- 98 Defarge, N., Takács, E., Lozano, V. L., Mesnage, R., Spiroux de Vendômois, J., Seralini, G.-E., & Székács, A. (2016). Co-Formulants in Glyphosate-Based Herbicides Disrupt Aromatase Activity in Human Cells below Toxic Levels. *International Journal of Environmental Research and Public Health*, 13(3), 264. <http://doi.org/10.3390/ijerph13030264>.
- 99 "New Evidence About the Dangers of Monsanto's Roundup," The Intercept, May 17, 2016. <https://theintercept.com/2016/05/17/new-evidence-about-the-dangers-of-monsantos-roundup/>.
- 100 "Weed-Whacking Herbicide Proves Deadly to Human Cells," Scientific American, June 23, 2009. <http://www.scientificamerican.com/article/weed-whacking-herbicide-p/>.
- 101 Benachour, N., and G. E. Seralini. "Glyphosate Formulations Induce Apoptosis and Necrosis in Human Umbilical, Embryonic, and Placental Cells." [In eng]. *Chem Res Toxicol* 22, no. 1 (Jan 2009): 97-105. <https://www.ncbi.nlm.nih.gov/pubmed/19105591>.
- 102 Krüger M, Schledorn P, Schrödl W, Hoppe HW, Lutz W, et al. (2014) Detection of Glyphosate Residues in Animals and Humans. *J Environ Anal Toxicol* 4: 210. <http://www.omicsonline.org/open-access/detection-of-glyphosate-residues-in-animals-and-humans-2161-0525.1000210.php?aid=23853>.
- 103 Monsanto, Background: Summary on Human Risk Assessment and Safety Evaluation on Glyphosate and Roundup Herbicide (Updated November 2014), Williams, Gary M, Kroes, Robert, Munro, Ian C. <http://www.monsanto.com/glyphosate/documents/summary-of-human-risk-assessment-and-safety-evaluation.pdf>.
- 104 USEPA. 1993. Reregistration Eligibility Decision (RED) Glyphosate. Office of Prevention, Pesticides and Toxic Substances. Washington DC.
- 105 Krüger M, Schledorn P, Schrödl W, Hoppe HW, Lutz W, et al. (2014) Detection of Glyphosate Residues in Animals and Humans. *J Environ Anal Toxicol* 4: 210.
- 106 Larsen K, Najle R, Lifschitz A, Mate ML, Lanusse C, Virkel GL. Effects of Sublethal Exposure to a Glyphosate-Based Herbicide Formulation on Metabolic Activities of Different Xenobiotic-Metabolizing Enzymes in Rats. *Int J Toxicol* 2014. <https://www.ncbi.nlm.nih.gov/pubmed/24985121>.
- 107 Franks AL, Slansky JE. Multiple associations between a broad spectrum of autoimmune diseases, chronic inflammatory diseases and cancer. *Anticancer Res.* 2012;32:1119-36. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3349285/heb>.
- 108 IARC Monograph Glyphosate is probably carcinogenic to humans (Group 2A) 2015, <http://monographs.iarc.fr/ENG/Monographs/vol112/mono112-09.pdf>.
- 109 Parks CG, Hoppin JA, DeRoos AJ, Costenbader KH, Alavanja MC, Sandler DP. 2016. Rheumatoid arthritis in Agricultural Health Study spouses: associations with pesticides and other farm exposures. *Environ Health Perspect*; doi:10.1289/EHP129 <http://ehp.niehs.nih.gov/ehp129/>.
- 110 "Glyphosate link with rheumatoid arthritis shown in new study," GMWatch, June 12, 2016 <http://www.gmwatch.org/news/latest-news/17022-glyphosate-link-with-rheumatoid-arthritis-shown-in-new-study>.
- 111 International, Programme on Chemical Safety (IPCS), Pesticide Residues in Food 2004, Evaluations Part II Toxicological, Joint FAO/WHO Meeting on Pesticide Residues. [http://apps.who.int/iris/bitstream/10665/43624/1/9241665203\\_eng.pdf](http://apps.who.int/iris/bitstream/10665/43624/1/9241665203_eng.pdf).
- 112 Attorney General of the State of New York 1996. In the Matter of Monsanto Company, Respondent. Assurance of Discontinuance Pursuant to Executive Law § 63(15). New York: Attorney General of the State of New York, Consumer Frauds and Protection Bureau, Environmental Protection Bureau.
- 113 "Monsanto Fined in France for 'False' Herbicide Ads." TerraDaily.com. January 27, 2007. <http://www.terradaily.com/2006/070126154451.ovopjxml.html>
- 114 Oates L, Cohen M, Braun L, Schembri A, Taskova R. Reduction in urinary organophosphate pesticide metabolites in adults after a week-long organic diet. *Environ Res.* 2014;132:105-111. <https://www.ncbi.nlm.nih.gov/pubmed/24769399>